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Education

Research Associate in Biostatistics	University of Pennsylvania	2025.06–now	Advisor: Yong Chen
Postdoc in Biostatistics	University of Pennsylvania	2023.08–2025.06	Advisor: Yong Chen
Ph.D. in Statistics	Peking University	2018.09–2023.06	Advisor: Wei Lin
B.S. in Statistics	Nankai University	2014.09–2018.06	

Publications and Preprints

* denotes equal contribution (co-first authors).

• Published

1. Caizhi Tang*, **Huiyuan Wang*** (co-first authors), Xinyu Li, Qing Cui, Ya-Lin Zhang, Feng Zhu, Longfei Li, Jun Zhou, and Linbo Jiang. Debiased Causal Tree: Heterogeneous Treatment Effects Estimation with Unmeasured Confounding. *Advances in Neural Information Processing Systems* 35, 2022, 5628–5640.
2. Caizhi Tang*, **Huiyuan Wang*** (co-first authors), Xinyu Li, Qing Cui, Longfei Li, and Jun Zhou. Difference-in-Differences Meets Tree-based Methods: Heterogeneous Treatment Effects Estimation with Unmeasured Confounding. In *Proceedings of the 40th International Conference on Machine Learning (ICML)*, 2023, 33792–33803.
3. Xuyang Zhao, **Huiyuan Wang**, and Wei Lin. The Aggregation–Heterogeneity Trade-off in Federated Learning. In *Proceedings of the 36th Annual Conference on Learning Theory (COLT)*, 2023, 5478–5502.
4. Xuyang Zhao, **Huiyuan Wang**, Weiran Huang, and Wei Lin. A Statistical Theory of Regularization-Based Continual Learning. In *the 41th International Conference on Machine Learning (ICML)*, 2024, 61021–61039.
5. Xiang Li, Feng Ruan, **Huiyuan Wang**, Qi Long, and Weijie J. Su. A Statistical Framework of Watermarks for Large Language Models: Pivot, Detection Efficiency and Optimal Rules. *The Annals of Statistics* 53(1), 2025, 322–351. Invited for presentation at the *Annals of Statistics* discussion session, Joint Statistical Meetings 2025.
6. Xiang Li, Feng Ruan, **Huiyuan Wang**, Qi Long, and Weijie J. Su. Robust Detection of Watermarks for Large Language Models under Human Edits. *Journal of the Royal Statistical Society, Series B*, 2025. Accepted.
7. Shucong Zhang, **Huiyuan Wang**, and Wei Lin. CARE: Large Precision Matrix Estimation for Compositional Data. *Journal of the American Statistical Association: Theory and Methods* 120(549), 2025, 305–317.
8. Dazheng Zhang*, Bingyu Zhang*, **Huiyuan Wang*** (co-first authors), Yiwen Lu, Charles J. Wolock, Wenjie Hu, Linbo Wang, George Hripcsak, and Yong Chen. Negative-Control-Calibrated Difference-in-Difference Analyses: Addressing Unmeasured Confounding in RWD with Application to Racial/Ethnic Differences. *NPJ Digital Medicine* 8(1), 2025, 452.
9. Yong Chen, Yiwen Lu, Jingmei Qiu, **Huiyuan Wang**, and Yudong Wang. MOSAiC: Multi-site One-Shot Aggregation of Compressed Risk Functions. *Journal of the American Statistical Association: Applications and Case Studies (with Discussion)*, 2026. (In Alphabetical Order)

• Under Revision

10. Jingyue Huang, Yuqing Lei, **Huiyuan Wang**, and Yong Chen. ANCHOR: Double Machine Learning for NCO-Calibrated Adaptive Marginal Sensitivity Bounds. *Annals of Applied Statistics (Rejection and Resubmission)*, 2026+.

11. Yuru Zhu, **Huiyuan Wang**, Haitao Chu, Yumou Qiu, and Yong Chen. Collaborative Indirect Treatment Comparisons with Multiple Distributed Single-Arm Trials. *arXiv:2509.23664. Journal of the American Statistical Association: Theory and Methods (Rejection and Resubmission)*, 2026+.
12. Jianmin Chen, **Huiyuan Wang**, Thomas Lumley, Xiaowu Dai, and Yong Chen. Surrogate-Powered Inference: Regularization and Adaptivity. *Journal of the American Statistical Association: Applications and Case Studies (Major Revision)*, 2026+.
13. **Huiyuan Wang**, and Wei Lin. Nonasymptotic Theory for Two-Layer Neural Networks: Beyond the Bias–Variance Trade-off. *arXiv:2106.04795. Journal of Machine Learning Research (Reject-and-Resubmit)*, 2025+.
- **Under Review**
14. **Huiyuan Wang**, Bingyu Zhang, Yumou Qiu, and Yong Chen. Distributional Calibration: A Conformal Inference Framework for Unmeasured Confounding Using Reference Outcomes. *Journal of the American Statistical Association: Applications and Case Studies (Under Review)*, 2025+.
15. **Huiyuan Wang**, Jie Hu, Jingmei Qiu, Jianqing Fan, and Yong Chen. FastCAR: A Lossless, One-Shot Algorithm for Distributed Causal Inference with Unspecified Heterogeneity. *Biometrika (Under Review)*, 2025+.
16. **Huiyuan Wang**, Jie Hu, Yang Ning, and Yong Chen. Semi-Supervised Inference with Efficient Use of Auxiliary Information for High-Dimensional Drug Repurposing. *Journal of the American Statistical Association: Applications and Case Studies (Under Review)*, 2025+.
17. **Huiyuan Wang***, Yalong Lyu* (co-first authors), and Wei Lin. Temporal Point Process Graphical Models. *arXiv:2110.11562*. 2025+.
18. **Huiyuan Wang**, Xuyang Zhao, and Wei Lin. Heterogeneous Federated Learning on Arbitrary Graphs. *arXiv:2209.08737*, 2022.
19. Yiwen Lu*, **Huiyuan Wang*** (co-first authors), Dazheng Zhang, Tingyin Wang, Ying Lu, Huilin Tang, Jie Hu, Yudong Wang, and Yong Chen. Dual Role for Negative Control Outcomes: Improving Validity and Efficiency in Observational Studies. *Nature Communications (Under Review)*, 2025+.
20. Jingyue Huang, **Huiyuan Wang**, Yuqing Lei, and Yong Chen. Efficient Semiparametric Inference for Distributed Data with Blockwise Missingness. *arXiv:2508.16902. Journal of the American Statistical Association: Theory and Methods (Submitted)*, 2026+.
21. Jingyue Huang, **Huiyuan Wang**, Bingyu Zhang, and Yong Chen. OPTIC: Streamlined Target Trial Emulation for Efficient, Generalizable Real-World Evidence. *Journal of the American Statistical Association: Applications and Case Studies (Submitted)*, 2025+.
22. Yue Wu, **Huiyuan Wang**, Runze Li, Jianqing Fan, and Yong Chen. FedNN: Communication-Efficient Distributed Inference via Neural Network Sobolev Training. *Journal of the American Statistical Association: Theory and Methods (Submitted)*, 2026+.

Awards

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| 1. Top Reviewer (Top 10%) at NeurIPS | 2025 |
| 2. The Excellent Poster Award of the The Sixth Peking–Tsinghua University Statistical Forum | 2022 |
| 3. The Second Prize of the Fourth National Academic Forum for Doctoral Students in Statistics (Chinese Association for Applied Statistics) | 2020 |
| 4. Outstanding Graduate (Nankai University) | 2018 |

Teaching Experience

1. Recitation Instructor for *Advanced Mathematics B*, School of Mathematical Sciences, Peking University, Fall 2022
2. Teaching assistant for *Advanced Theory of Statistics II*, School of Mathematical Sciences, Peking University, Spring 2021

3. Recitation Instructor for *Advanced Mathematics D*, School of Mathematical Sciences, Peking University, Fall 2020
4. Teaching assistant for *Modern Statistical Modeling*, School of Mathematical Sciences, Peking University, Spring 2020
5. Teaching assistant for *Statistical Learning*, School of Mathematical Sciences, Peking University, Fall 2019

Talks

1. *Calibrated Digital Twins: Improving RCT Analysis with Distributionally Shifted RWD* at an *Invited Session* on Joint Statistical Meetings, Nashville, 2025
2. *Augmented Targeted Trial Emulation* on Joint Statistical Meetings, Nashville, 2025
3. *Negative Control-Calibrated Difference-in-Difference Analyses: Addressing Unmeasured Confounding in Real-World Data with Application to Quantifying the Impact of Pandemic on Racial/Ethnic Differences* on Joint Statistical Meetings, Nashville, 2025
4. *Augmented Targeted Trial Emulation* on International Chinese Statistical Association Applied Statistics Symposium, Storrs, 2025
5. *Efficient and robust high-dimensional hypothesis testing with surrogate outcomes* on International Chinese Statistical Association Applied Statistics Symposium, Nashville, 2024
6. *CARE: Large precision matrix estimation for compositional data* on The Fourth National Academic Forum for Doctoral Students in Statistics (held by Chinese Association for Applied Statistics), Guangzhou, 2020

Service

1. *Reviewer* for ICLR, 2025
2. *Reviewer* for NeurIPS, 2025
3. *Reviewer* for the *Best Student Paper Award*, International Chinese Statistical Association, 2025
4. *Organizer* of an invited session for International Chinese Statistical Association, 2025
5. *Reviewer* for JASA, 2023, 2025
6. *Reviewer* for ALT, 2023–2025
7. *Reviewer* for JCGS, 2022

Memberships

1. American Statistical Association
2. International Chinese Statistical Association
3. The Society for Causal Inference
4. Causal Inference Branch of the Chinese Association for Applied Statistics